DRAFT Institutional Controls Data Element Registry

Background

Beginning in June 2002, EPA organized and facilitated a series of focus group discussions with representatives from EPA Headquarters (HQ) and Regions, other Federal Agencies, States and Tribes, local governments, non-governmental organizations, and industry. Through the focus group deliberations, an understanding of the core data categories that were essential to the tracking of institutional controls (ICs) was developed. The six focus groups culminated with the Institutional Controls Data Exchange Training and Workshop, held May 12 - 14, 2003, in Chicago, Illinois, where participants worked to develop a common language related to ICs (i.e., a dictionary and thesaurus of IC terms), to provide the information needed to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy.

The Model Data Element Dictionary (DED) distributed at the workshop included specific data elements for the IC data categories developed during the previous focus groups. Based on discussions during the workshop the Model DED was revised as the IC Data Element Registry (IC DER) because data element dictionaries usually define the data elements of a specific database. Additionally, the IC DER has been reorganized to assist users in understanding the relationships of the data categories as well as to reflect the organization of the XML schema, used to transmit electronic data deliverables (EDDs). Due to this reorganization, the category numbering system was removed. Permissible values for applicable data elements have been presented in the form of examples rather than strict data restrictions and are presented within Appendix B because workshop participants found that they were not representative of all stakeholders' requirements and would require further discussions. The IC DER – a compilation of existing and potential data elements contained in databases that track ICs in partnership with EPA – is presented below.

Establishing Relationships Between IC Information Categories

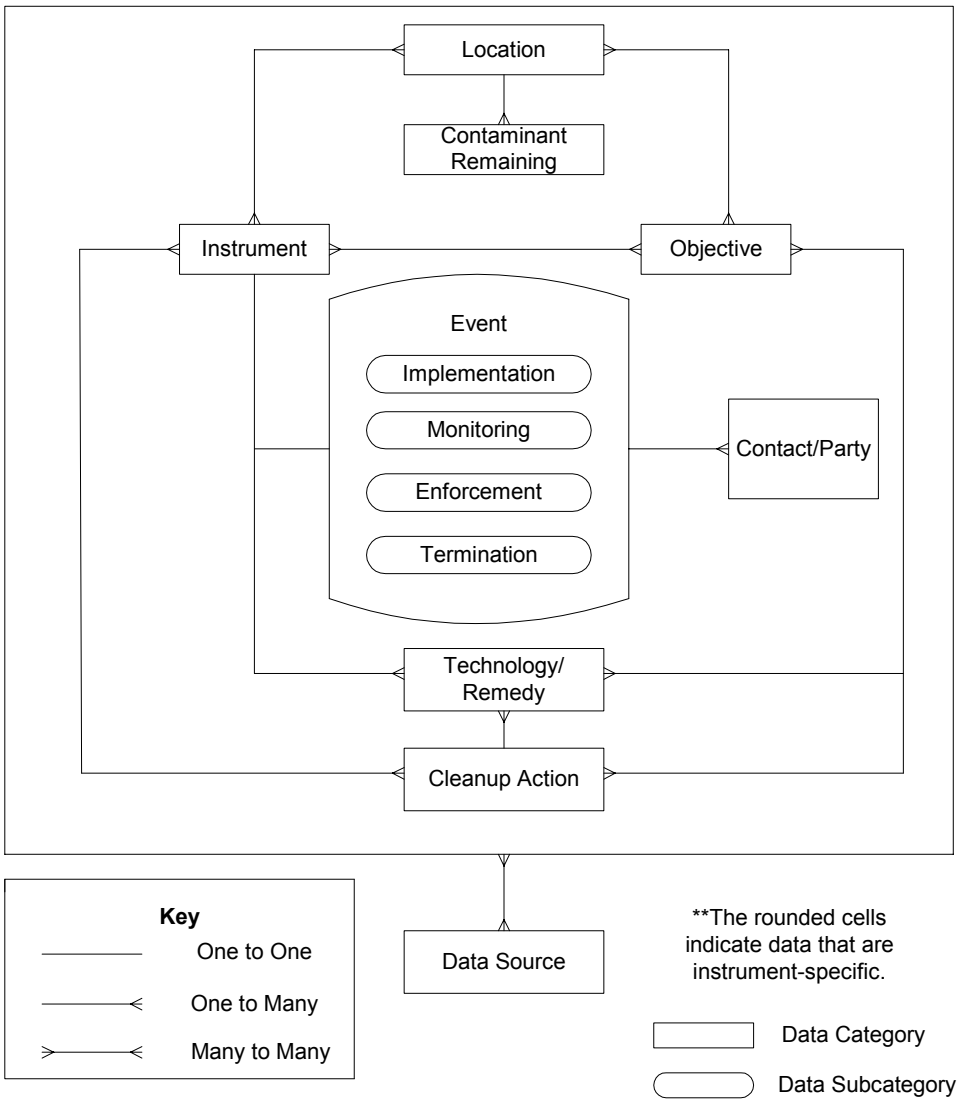
Effective tracking of ICs entails describing complex high-level relationships among information categories. It is essential that these relationships be established in order for IC tracking systems to communicate effectively. Therefore, an IC Data Category Relationship Diagram is provided to illustrate these relationships. The diagram, presented on page 2, is a non-hierarchical representation of the relationships between IC information categories to assist participating IC tracking systems in establishing proper identification mechanisms. For more detailed descriptions of the relationships between data elements, refer to the IC Data Standard document or the Business Rules for IC Data Standard document.

The Location, IC Instrument, and IC Objective categories are grouped together to illustrate that an IC is identified by a location(s) where either a planned or implemented instrument(s) is established to meet an objective(s). IC implementation, monitoring, enforcement, and termination occur as particular events during the life of an IC instrument (e.g., the date of implementation of an IC instrument). Therefore, this instrument-specific information is listed under the Event information subcategory as Implementation, Monitoring, Enforcement, and Termination. This relationship is reinforced in the diagram. The Contact/Party data category is included to track the persons and entities that are designated to manage or handle inquiries about IC implementation, monitoring, enforcement, and termination. Because most ICs are established to protect human health and the environment from contamination remaining at a location, information regarding each contaminant is included under the Contaminant Remaining data category. In the event that an IC is put into place to protect a cleanup remedy or technology, the Technology/Remedy

data category is provided to track that type of information. Also, some IC systems track instruments and technology/remedy information in the context of cleanup actions. Therefore, the Cleanup Action data category is included and is related to the IC Instrument, IC Objective, and Technology/Remedy information categories.

To enhance the quality of IC information, the Data Source data category is included to track meta data and to provide users with the original source of the IC data. All IC information categories are related to a data source, which provides additional descriptive information about the document or resource cited such as the type, name, location, or Internet address.

IC Data Category Relationship Diagram



Understanding Objectives and Use Restrictions

A subtle difference exists between what is referred to as the objective of an IC and the use restriction that an IC instrument outlines. The objective of an IC is defined as the intended goal of the IC in preventing or reducing human exposure to remaining contamination and/or protecting the integrity of a remedy by limiting land or resource use. IC objectives are typically outlined within regulatory environmental cleanup documents; however, use restrictions are usually specified in the IC instrument and are intended to meet IC objectives. For example, a decision document (e.g., a Record of Decision (ROD)) may call for an IC with an objective of prohibiting dermal contact with contaminated soil remaining onsite, while the implemented IC instrument (e.g., a restrictive covenant) may outline specific use limitations, including prohibiting excavation of soil on the property to meet the IC objective outlined in the ROD. Because use restrictions are typically outlined in IC instruments, they are included under the data category of IC Instrument within the IC DER. IC objectives are included under a separate data category because they are typically outlined independently in regulatory environmental cleanup documents prior to the development of use restrictions.

Establishing IC Identification Components

To unequivocally identify an IC, one must look at the definition of an IC, which consists of one or more locations where a set of use restrictions are specified in one or more IC instruments to reduce the risk of exposure to remaining contamination. This definition gives rise to the need for a two-part identification system consisting of a Location ID and an IC Instrument ID. The combination of these two identifiers provides the capability to uniquely identify an IC.

Some systems may track IC objectives at a specific location, and therefore, may potentially need a combination of a unique Location ID and an IC Objective ID. However, this combination would not constitute an IC until an instrument is put into place to achieve the stated objectives through specific use restrictions. Hence, an IC Objective ID may be needed in some systems but is not required to uniquely identify an IC.

In addition, the relationship between the components of an IC may differ based on the situation and the requirements of an individual IC tracking system. For example:

- one instrument may apply to many locations and may establish many use restrictions;
- one location may have many instruments, and therefore many use restrictions;
- many instruments may be used to achieve a single objective; and
- many objectives may be achieved through a single instrument.

The following discussion explains both IC identification components (Location ID and IC Instrument ID) in more detail:

1) <u>The Location Covered by the IC (Location ID)</u>

Location information can be expressed in one or more of the following ways:

- as a geographical description of the location, such as an entire city or county;
- as a site/facility description of the location, such as a CERCLIS ID or EPA Site ID; or

- as an area boundary reference description of the location, such as latitude and longitude coordinates representing a portion of a parcel, an entire parcel, or several parcels.

For example, a governmental IC (e.g., a state regulation or a local ordinance) may apply to an entire state or to a jurisdiction within the state. Since the location and boundaries for which the IC is applicable would be important information to the public and those who monitor and enforce the IC, the exchange of a geographical location description, site/facility description, or an area boundary reference description of the IC location is essential.

Location information may be linked to ICs in one of two ways: coverage or association.

- location information linked to an IC as a ***coverage*** indicates that the linked location defines the boundaries of the IC.

- location information linked to an IC as an ***association*** indicates that the IC is associated with the location, but the location does not necessarily describe the boundaries of the IC.

For example, several ICs may be used at a site. Those ICs may be ***associated*** to some administrative location descriptor of the site, such as the site id or address. However, some of those same ICs may be implemented to protect a portion of a total area of the site, and others may be implemented to prevent exposure to contaminants that either migrated off-site or are no longer are part of the site current boundaries. To define the boundaries of those ICs, one would define each location that they protect and link the appropriate ICs to the appropriate locations using the ***coverage*** method.

The "Coverage Indicator" data element is used to differentiate coverage from association. A value of "yes" indicates coverage. A value of "no" (or the absence of this data element) indicates association.

2) <u>The Instrument that Records the Use Restriction (IC Instrument ID)</u>

IC Instrument ID is a unique identifier that identifies the instrument and links all elements of a particular instrument. Because the types of IC instruments vary widely, it is expected that different systems have different mechanisms to identify IC instruments. However, it is important that a system has a unique identifier for each instrument to prevent double counting when an instrument spans several locations (i.e., an instrument that is applicable at two sites should not be counted twice). It is equally important that the IC Instrument not be counted twice among different IC systems. Therefore, it is important that the various instrument identifiers of the participating systems are registered (e.g., link the same instrument that is identified differently in two systems).

Presentation of IC Data Elements

IC data elements are presented below based on the logical groupings identified in the IC Data Category Relationship Diagram. The groupings begin with IC Instrument, IC Objective, and Location. The information regarding the implementation, monitoring, enforcement, and termination of a particular IC instrument is gathered under the IC Instrument data category because these groups of IC data are instrument-specific. The Location information grouping is further divided into three subsections: Location Description, Site/Facility, and Geographic Coordinate. Next, the information categories of Contaminant Remaining, Cleanup Action, Contact/Party, and Data Source are presented, followed by Technology/Remedy. Appendix A contains frequently referenced data element groups. Appendix B contains a list of example permissible values.

Data Element	Definition	Definition Source[1]	Data Type Data Length
IC Instrument			
IC Instrument ID	Unique identifier that identifies the instrument and links all elements of a particular instrument.	EPA's Institutional Controls Tracking System (ICTS)	Alphanumeric 32
IC Instrument Name	Name of an administrative measure or legal mechanism that establishes a specific use restriction. (*Note:* If the IC Instrument is a permit, the IC Instrument Name is to be interpreted as the name or alphanumeric identifier assigned to the permit by a permit issuing/granting organization to identify a permit or permit application.)	Combines ICTS, New York Department of Environmental Conservation Hazardous Waste - Voluntary Cleanup Program Remediation Management System (NYDEC), & Missouri Site Management and Reporting System (SMARS)	Alphanumeric 100
IC Instrument Category	Major IC classification to which the administrative measure or legal mechanism belongs (e.g., Government, Proprietary, Enforcement, or Informational).	ICTS	Alphanumeric 25
IC Instrument Type	Type of administrative measure or legal mechanism, further specified from the IC instrument category (e.g., Restrictive Covenant within the Proprietary Category). (*Note:* If the IC Instrument is a permit, the IC Instrument Type is to be interpreted as the type of permit issued or granted to a regulated entity.)	Combines ICTS, Florida Institutional Control Registry Database (FLICR), NYDEC, & SMARS	Alphanumeric 50
Issuing Organization	Information about the organization issuing or granting a permit, instrument, or document. See Appendix A - Organization data category for details.	Combines ICTS, EDR Facility Identification Data Standard (FIDDS) & EDR Permitting Information Data Standard (PermitII)	N/A
Use Restriction Text	The text describing the land or resource use specifically prohibited or restricted by the language of the IC.	Combines U.S. Army's Defense Site Environmental Restoration System (DSERTS), FLICR, NYDEC, SMARS, & Chicago Workshop	Alphanumeric 200
Use Restriction Condition	A description of the conditions of the land or resource use specifically prohibited or restricted by the language of the IC.	Combines DSERTS, FLICR, NYDEC, SMARS, & Chicago Workshop	Alphanumeric 2000

Data Element	Definition	Definition Source[1]	Data Type Data Length
IC Protection Duration	The life span of the IC indicated as permanent or temporary.	Combines ICTS, FLICR, & NYDEC	Alphanumeric 10
Conditions of IC Protection Duration	Text field used to specify conditions upon which IC duration is contingent.	Chicago Workshop	Alphanumeric 2000
Document			
Document	Any document used as a source of information or legal mechanism. See Appendix A - Document data category for details.	ICTS	N/A
Mandated IC Action	The IC action required/authorized by the document (e.g., IC Monitoring, IC Enforcement).	ICTS	Alphanumeric 30
Event			
Event ID	A unique identifier that links an event to an IC instrument or contact.	ICTS	Alphanumeric 32
Event Type	A textual description of the type of event (e.g., IC Implementation, IC Monitoring, IC Enforcement, etc.).	ICTS	Alphanumeric 50
Event Frequency Unit	The unit of measurement associated with a frequency value (e.g., Days, Weeks, Months, etc.).	ICTS	Alphanumeric 25
Event Frequency Value	The frequency with which an event, qualified by a frequency unit, takes place.	ICTS	Numeric 13
Event Date Type	The scheduled or chronological qualification of the date of an event (e.g., Start Date, Planned Date, etc.).	ICTS	Alphanumeric 50
Event Date	The date that an event is scheduled to occur or has occurred.	ICTS	Date 8
Event Results Text	The textual description containing the results of an event on a particular date.	ICTS	Alphanumeric 1000

Data Element	Definition	Definition Source[1]	Data Type Data Length
IC Objective			
IC Objective ID [2]	Unique identifier for a particular media/goal combination.	ICTS	Alphanumeric 32
IC Objective Name	The name designating the media/goal combination.	ICTS	Alphanumeric 50
IC Protected Media	The type of major environmental component(s) contaminated and protected by the IC (e.g., Ground Water, Soil, etc.).	Combines ICTS, DSERTS, FLICR, NYDEC, & SMARS	Alphanumeric 100
IC Goal	The intended purpose of the IC in preventing or reducing human exposure to remaining contamination (e.g., Prohibit Dermal Contact).	Combines ICTS, DSERTS, FLICR, NYDEC, & SMARS	Alphanumeric 200
Location			
Location ID	Unique identifier that groups and links all information elements of a location.	Chicago Workshop	Alphanumeric 32
Coverage Indicator	Indicator of the nature of an association to a location. A value of "Yes" implies that the location is specific to the boundaries of an IC. A value of "No" implies that the location is a standard association with a site, geographic area, or boundary reference as a whole. (*Note:* The absence of this data element is to be interpreted as a value of "No.")	ICTS	Alphanumeric 3
Location Description			
Geographic Address	The physical location of an individual, organization, site/facility, or area. See Appendix A - Geographic Address data category for details.	Combines ICTS, EDR Contact Information Data Standard (Contact), & EDR FIDDS	N/A
Site/Facility			
Site/Facility ID Type	The name of an identifier that designates a site/facility and is unique to a system, regulatory program, or entity (e.g., Brownfields Site, CERCLIS Site ID, EPA Site ID, etc.).	ICTS	Alphanumeric 60
Site/Facility ID	The value of an identifier that designates a site/facility and is unique to a system, regulatory program, or entity.	Combines ICTS & Chicago Workshop	Alphanumeric 32

Data Element	Definition	Definition Source[1]	Data Type Data Length
Site/Facility Name Type	Identifier that designates the use of a site/facility name by a system, regulatory program, or entity (e.g., Brownfields Site Name, CERCLIS Site Alias Name, CERCLIS Site Name, etc.).	Chicago Workshop	Alphanumeric 60
Site/Facility Name	The public or commercial name of a site/facility, including any aliases (i.e., the full name that commonly appears on invoices, signs, or other business documents, or as assigned by the state when the name is ambiguous).	Combines ICTS & EDR FIDDS	Alphanumeric 80
Operable Unit or Area Number	The designation for the operable unit or portion of the site with which actions are associated.	Combines ICTS, DSERTS, & Chicago Workshop	Alphanumeric 10
Operable Unit or Area Name	The name of the operable unit or portion of the site with which actions are associated.	Combines ICTS, DSERTS, & Chicago Workshop	Alphanumeric 60
Area or Sub- Area Within Operable Unit or Area	The distinct area of contamination within an operable unit or portion of a site with which actions are associated (e.g., Area of Contamination, Containment Cell, etc.).	Combines ICTS, DSERTS, & Chicago Workshop	Alphanumeric 60
Geographic Coordinate			
Coordinate Sequence ID	Unique identifier that links coordinate points in the proper order to describe a specific location.	ICTS	Alphanumeric 32
Latitude Measure	The measure of the angular distance on a meridian north or south of the equator in decimal notation.	Combines ICTS & EDR Latitude/Longitude Data Standard (LLDS)	Alphanumeric 10
Longitude Measure	The measure of the angular distance on a meridian east or west of the prime meridian in decimal notation.	Combines ICTS & EDR LLDS	Alphanumeric 11
Horizontal Collection Method Text	The text that describes the method used to determine the latitude and longitude coordinates for a point on the earth.	EDR LLDS	Alphanumeric 60
Horizontal Reference Datum Name	The name that describes the reference datum used in determining latitude and longitude coordinates.	EDR LLDS	Alphanumeric 7

Data Element	Definition	Definition Source[1]	Data Type Data Length
Reference Point Text	The text that identifies the place for which geographic coordinates were established.	EDR LLDS	Alphanumeric 60
Source Map Scale Number	The number that represents the proportional distance on the ground for one unit of measure on the map or photo; required only when a map has been used to determine latitude and/or longitude information. (*Note:* Required only when a map has been used to determine latitude and/or longitude information.)	Combines ICTS & EDR LLDS	Alphanumeric 10
Horizontal Accuracy Measure	The measure of the accuracy (in meters) of the latitude and longitude coordinates.	EDR LLDS	Alphanumeric 6
Contaminant Remaining			
Contaminated Media	The type of major environmental component(s) contaminated (e.g., Ground Water, Soil, etc.).	Combines DSERTS, FLICR, NYDEC, & SMARS	Alphanumeric 100
EPA Chemical Internal Tracking Number	The unique identifier assigned to a chemical substance for Environmental Protection Agency use.	EDR Chemical Identification Data Standard (CIDDS)	Alphanumeric 9
Chemical Abstracts Service Registry Number	The unique number assigned by Chemical Abstracts Service (CAS) to a chemical substance.	EDR CIDDS	Alphanumeric 9
Chemical Substance Systematic Name	The name assigned to a chemical substance that describes it in terms of its molecular composition.	EDR CIDDS	Alphanumeric 2000
EPA Chemical Registry Name	The name that the Environmental Protection Agency has selected as its preferred name for a chemical substance.	EDR CIDDS	Alphanumeric 2000
EPA Chemical Identifier	An identifier to be created and placed in the Chemical Registry for each chemical substance or chemical grouping in the Chemical Registry for which a CAS Registry Number does not exist and cannot be assigned.	EDR CIDDS	Alphanumeric 9
Chemical Substance Type Name	A descriptive name for types of chemical substances.	EDR CIDDS	Alphanumeric 20

Data Element	Definition	Definition Source[1]	Data Type Data Length
Cleanup Action			
Cleanup Action ID	Unique identifier that links all cleanup action elements to a particular IC instrument, IC objective, or technology/remedy.	ICTS	Alphanumeric 32
Action Type	Full description of a specific response, non-response (generic), support, enforcement (e.g., response negotiations, settlement actions, litigation), or non-site specific response or support action within the Superfund program (i.e., a CERCLIS action).	Combines ICTS & Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)	Alphanumeric 50
Operable Unit Number	Designation for the operable unit or portion of the site with which actions are associated.	Combines ICTS & CERCLIS	Alphanumeric 2
Action Code ID	Identifier to distinguish between multiple occurrences of the same action at the same site or operable unit.	Combines ICTS & CERCLIS	Alphanumeric 3
Actual Start Date	Approved date an action actually started.	Combines ICTS & CERCLIS	Date 8
Actual Completion Date	Approved date an action was actually completed.	Combines ICTS & CERCLIS	Date 8
Planned Start Date	Approved date an action is currently planned to start.	Combines ICTS & CERCLIS	Date 8
Planned Completion Date	Approved date an action is currently planned to be completed.	Combines ICTS & CERCLIS	Date 8
Contact/Party			
Contact/Party ID	Unique identifier that links all contact/party data elements to a particular IC related event.	ICTS	Alphanumeric 32
Individual Title Text	The title held by a person in an organization.	EDR Contact	Alphanumeric 40
Name Prefix Text	The text that describes the title that precedes an individual's name (e.g., Dr., Mrs., Ms.).	EDR Contact	Alphanumeric 15

Data Element	Definition	Definition Source[1]	Data Type Data Length
First Name	The given name of an individual.	EDR Contact	Alphanumeric 30
Middle Name	The middle name or initial of an individual.	EDR Contact	Alphanumeric 10
Last Name	The surname of an individual.	EDR Contact	Alphanumeric 30
Name Suffix Text	Additional title that indicates lineage or professional title (e.g., Jr., Sr.).	EDR Contact	Alphanumeric 20
Organization	The particular word(s) regularly connected with a unique framework of authority within which a person or persons act, or are designated to act, towards some purpose. See Appendix A - Organization data category for details.	Combines ICTS & EDR Contact	N/A
Mailing Address	The exact address where a piece of mail is intended to be delivered, including urban-style street address, rural route, and PO Box.	Combines EDR Contact & EDR FIDDS	Alphanumeric 50
Supplemental Address Text	The text that provides additional information to facilitate the delivery of a mail piece, including building name, secondary units, and mail stop or local box numbers not serviced by the USPS.	Combines EDR Contact & EDR FIDDS	Alphanumeric 50
Mailing Address City Name	The name of the city, town, or village where the mail is delivered.	Combines EDR Contact & EDR FIDDS	Alphanumeric 30
Mailing Address State Code	The alphabetic code that represents the name of a principle administrative subdivision of the United States, Canada, or Mexico.	EDR Contact	Alphanumeric 5
Mailing Address State Name	The name of the state where mail is delivered.	Combines EDR Contact & EDR FIDDS	Alphanumeric 35
Mailing Address ZIP Code	The combination of the five-digit Zone Improvement Plan (ZIP) code and the four-digit extension code (if available) that represents the geographic segment that is a subunit of the ZIP code, assigned by the U.S. Postal Service to a geographic location to facilitate mail delivery.	Combines ICTS, EDR Contact, & EDR FIDDS	Alphanumeric 10

Data Element	Definition	Definition Source[1]	Data Type Data Length
Electronic Address	A location within a system of worldwide electronic communication where a computer user can access information or receive electronic mail. See Appendix A - Electronic Address data category for details.	EDR Contact	N/A
Telephone Number	The number that identifies a particular telephone connection.	EDR Contact	Alphanumeric 15
Telephone Number Type Name	The name that describes telephone number types (e.g., Fax, Home, Mobile, Office, Pager).	EDR Contact	Alphanumeric 10
Telephone Extension Number	The number assigned within an organization to an individual telephone that extends the external telephone number.	EDR Contact	Alphanumeric 5
Data Source			
Data Source ID	Unique identifier used to link a reference or citation to an IC related data element.	ICTS	Alphanumeric 32
Document			
Document	Any document used as a source of information or legal mechanism. See Appendix A - Document data category for details.	ICTS	N/A
Application			
Application Name	The name of an application used as a source of information or database.	ICTS	Alphanumeric 100
Application Development Language	The programming language in which the application was written/developed (e.g., C++, Dbase, Foxpro, etc.).	ICTS	Alphanumeric 50
Application Database Type	The database type in which application data are stored (e.g., Oracle, SQL Server, DB2, etc.).	ICTS	Alphanumeric 50
Application Access Type	The type of access that users have to the application (e.g., Public Access, Restricted Access - Free, etc.).	ICTS	Alphanumeric 100
Application Comments	General comments about the application.	ICTS	Alphanumeric 100

Data Element	Definition	Definition Source[1]	Data Type Data Length
Electronic Address	A location within a system of worldwide electronic communication where a computer user can access information or receive electronic mail. See Appendix A - Electronic Address data category for details.	EDR Contact	N/A
Technology/Remedy			
Technology/ Remedy ID	Unique identifier used to link technology/remedy information to an IC instrument, IC objective, and/or cleanup action.	ICTS	Alphanumeric 32
Engineered Control/Remedy Protected by IC	Engineered control/remedy used at the site/facility and protected by the IC.	ICTS	Alphanumeric 100
Media Associated with Engineered Control/Remedy	The type of major environmental component(s) contaminated and associated with the engineered control/remedy (e.g., Ground Water, Soil, etc.).	ICTS & CERCLIS	Alphanumeric 100

1. The IC DER uses the following sources for definitions:

   EPA's Environmental Data Element Registry (EDR) Facility Identification Data Standard (FIDDS), Latitude/Longitude Data Standard (LLDS), Contact Information Data Standard (Contact), Chemical Identification Data Standard (CIDDS), Permitting Information Data Standard (PermitII); EPA's Institutional Controls Tracking System (ICTS); Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS); Only EPA EDR data standards which are applicable to the data elements and their intended use in the IC DER were cited in the IC DER.

   U.S. Army's Defense Site Environmental Restoration System (DSERTS); New York Department of Environmental Conservation Hazardous Waste - Voluntary Cleanup Program Remediation Management System (NYDEC); Florida Institutional Control Registry Database (FLICR); Missouri Site Management and Reporting System (SMARS); Federal Geographic Data Committee (FGDC); and participant comments from EPA's May 12-14, 2003, Chicago IC Data Exchange Training and Workshop (Chicago Workshop).

2. IC Objective ID is not a required data element. It is included in the IC DER for those systems that track IC objectives at a specific location. See discussion on page 3 of the IC DER under "Establishing IC Identification Components."